Work Order ID Februarŷ-10-12 11:33:	•		*801	129*						Page 1
Revision ID:	664-203TRN / pe Turning Detail		Accept	*N900	040	100) * s	Setup Sta	ıvı	S1* S2*
	012 / Start Qty: 1.00 012 / Req'd Qty: 1.00	*1* *1*		Cust Item I Customer:	D:	-2,	e e	·		
Approvals: Proces	ss Plan: M.L.J	Date: 12 02		Da	ate:	-	R	Run Sta	rt *N	R1*
QC:	• •	Date:	SPC (Y/N):		ate:			Sto	*N	R2*
Sequence ID/ Work Center ID	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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D412-664-243	Rev E(DEO)						·			at Manual and a second
00	MORI SEIKI CNC LATH	IE LARGE	0.00				,	F		
100 Mori Seiki	Memo		0.00				-:(_	9		
Mori Seiki CNC Lathe Large	1-Fill tube w 2-Turn first s		T8534 on both ends as pe	er Folio FA166		A.	M.	l	12/0	2/23
¹¹0 * 11∩ *	QC1- Inspect dimensions	to dimension sheet	0.00	į.		i	(b		
QC	Memo		0.00					<u> </u>		
Quality Control	•					A	197	1,6	12,	102/2

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Part No	•	PAR #:	Fault Cate	jory:	NCI	R: Yes	No DQ	A:	Date:	
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DATE	STEP	Description of NC	<u> </u>		ction B	0! 0		ation	Approval	Approval
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Work Ord February-10-12				*801	129*						Page 2
Item ID: Revision ID: Item Name:	D412-664-2			Accept	*N9000	040100	ገ*	Setup	Start Stop	*NS	:1* :2*
Start Date: Required Date Reference:	10/02/2012 : 24/02/2012	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item ID: Customer:	:				IU.	
Approvals:		in:		Tooling: SPC (Y/N):	Date Date	e:		Run	Start	*NF	!1* !2*
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*130 *130* QC Quality Control		QC1- Inspect dimensions Memo	s to dimension sheet	0.00		W	_l 1911	e V	5 [2/23
140 *140* QC Quality Control		QC8- Inspect parts - seco	ond check	0.00		R) —	12		2-25	, >

W/O:	1277	WORK ORDER CHANGES											
DATE	STEP	PROC	EDURE CH	ANGE	Ву	Date Qt	Approval Chief Eng / Prod Mgr	Approval QC Inspector					
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Part No		PAR #:	_ Fault Cat	tegory:	NCR: Yes	No DQA: _	Date: _						
		esolution:											
NCR:		W	ORK ORI	DER NON-CONFORMAN	ICE (NCF	l)							
DATE	STEP	Description of NC		Corrective Action Section		Verificatio	n Approval	Approval					
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	Work Order ID 80129 Sebruary-10-12 11:33:23 AM			*801	29*		<u> </u>	Page 3
Revision ID:	D412-664-26		4; 	Accept	*N900040	1100*.	Setup Sta	INCOL
Start Date: Required Date: Reference:	10/02/2012 24/02/2012	Start Qty: 1.00 Req'd Qty: 1.00		1* 1*	Cust Item ID: Customer:		·	
Approvals:		in:		Tooling: SPC (Y/N):	Date:		Run Sta	"NRT"
Sequence ID/ Work Center ID 145 *145*)	Operation Description		Set Up/ Run Hours	Tool ID Tool #	Plan Acce Code Qty	ept Reject Qty	Reject Insp. Number Stamp
Crosstubes Crosstubes		Memo GRIND ONI	LY TRANSITIO	0.00 N LINES SMOOTH LONGITUDE W.	AY. Ru		12-2	2-27
150 *150* HandFXtube		Crosstubes Chemical Con	nversion	0.00	Ru		12-2	27_
Hand Finishing Cross	stubes	Qe3- Inspect Part Finish		0.00		\sim		
160		$\mathcal{Q}()$		0.00	A	,	12-6	2-27

Quality Control

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w/o : &c	129	WORK ORDER CH	CHANGES						
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / /Prod Mgr	Approval QC Inspector		
12-2-27	160	Sould read OC7	N	12-2-2	7	U ROBER	Such		

Part No: 17 412 - 664-203 PAR #:	Fault Category:	NCR: Yes No DQA:	Date:
Resolution:	Disposition:	QA: N/C Closed:	Date:

NCR:		WORK ORDER NON-CONFORMANCE (NCR)									
		Description of NC		Corrective Action Section B		Verification	Approval	Approval			
DATE	STEP	Section A	Initial Action Description Chief Eng Chief Eng		Sign & Date	Section C					
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Work Ord February-10-12				*80′	129*				Page 4
Item ID: Revision ID:	D412-664-2	03TRN		Accept	*N900	04010	N *	Setup Start	*NS1*
Item Name:	Crosstube Tu	rning Detail						Stop	*NS2*
Start Date: Required Date	10/02/2012 : 24/02/2012	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item I Customer:	D:			
Reference: Approvals:	Process Pla	an;	Date:	Tooling:	Da	nte:	-	Run Start	"NR1"
	QC:		_ Date:	SPC (Y/N):	Da	ate:	-	Stop	*NR2*
Sequence ID/ Work Center I	D	Operation Description		Set Up/ Run Hours	Tool ID	Tool # Plan Code	Accept Qty		Reject Insp. Number Stamp
170 Packaging		Packaging Memo		0.00				_ Ø	
Packaging		Location:	stock in kanban rack			M	nl	12/	02/27
180		QC21- Final Inspection -	- Work Order Release	0.00					
180 QC Quality Control		Memo		0.00				NCJ 1	2(02/28

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Part No	************	PAR #:	Fault Ca	tegory:	NCI	R: Yes	No DQ	A:	_ Date: _		
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DATE	STEP	Description of NC			ection B	0'	Verific	ation	Approval	Approval	
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Picklist Print February-10-12 11:33:27 AM Work Order ID: 80129 *80129* Parent Item: D412-664-203TRN *D412-664-203TRN* Crosstube Turning Detail Parent Item Name: Start Date: 10/02/2012 **Required Date: 24/02/2012** Required Qty: 1.00 Start Qty: 1.00 **Comments:** IPP Rev:A 08-03-06 new issue DD verified by:eec ø IPP Rev B 08.04.02 Removed polish EC verified by: DD Component Item ID/ Replacement Mfg/ Bin Primary Last Route Unit of Qty per Kit Qty on Total Qty Date Item Name Item Location Seq ID Measure Hand Item ID Purch Location Qty Issued Issued D6009-129 120 Each 43.0000 Manufactured No **

Crosstube Material

Location Loc Qty Loc Code LG 43 - anguil 12/02/02 43

Page 1

Status

W/O:			V	NORK ORDS	R CHANGES		•			
DATE	STEP	PRO	CEDURE CI	HANGE		Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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DATE	OTED	Description of NC		Corrective A			Verific	ation	Approval	Approval
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DART AEROSPACE LTD	Work Order:	80129
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 Rev: E		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

X First Article Prototype

	spection Sheet wing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
	2.684	+0.005/-0.000	2.689			mirc	CWC-C4
	2.748	+0.005/-0.000	2.753				
	2.884	+0.005/-0.000	2.889		,		
	3.019	+0.005/-0.000	3.024				
	3.163	+0.005/-0.000	3.165				
	3.308	+0.005/-0.000	3-3/3				
⋖,	3.429	+0.005/-0.000	3 431	V			
SIDE	2.990	+0.005/-0.000	2.994				
S	2.618	+0.005/-0.000	2.623	/		<i>y</i>	
	0.200	+/-0.010	(20()	<i>/</i> .		vern	CWC-08
	R0.063	+/-0.010	.(2.3			* RG	00000
	R0.500	+/-0.010	,500	/.	,	11	***
	4.971	+/-0.030	4.970	V	***************************************	vern	CNCOL
							· f
	2.684	+0.005/-0.000	2.689			m.rc	CNC-04
	2.748	+0.005/-0.000	2.752)	
	2.884	+0.005/-0.000	2.889				,
	3.019	+0.005/-0.000	3.023				
	3.163	+0.005/-0.000	2,164	/			7
	3.308	+0.005/-0.000	3.317	/			
m	3.429	+0.005/-0.000	3431	6		4	
SIDE	2.990	+0.005/-0.000	2993	/			
S	2.618	+0.005/-0.000	2.622			V	
	0.200	+/-0.010	1200			vern	(10-08
	R0.063	<u>.</u> +/-0.010	063			RG	<u> </u>
	R0.500	+/-0.010	500			· i	
	4.971	+/-0.030	4.470	1/		ven	CWC-08
	124.100	+/-0.020	124.101	X		tope	agric-1-02

Measured by: Audited by: Prototype Approval: N/A

Date: 12-2-25

Date: N/A

Rev	Date	Change	Revised by	Approved
Α	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
В	06.03.09	Dwg Rev updated	KJ/JLM	
С	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM .	.
_ D	10.02.02	Dimension 124.100 was 124.09	KJ K	W
		E Company of the Comp	199	1 197

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W/O:		· · · · · · · · · · · · · · · · · · ·	W	ORK ORDER CHANG	ES				
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DATE	STEP	Description of NC		Corrective Action Secti				Approval	Approval
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Item	Qty -243	Part Number	Description
1	Х	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
2	1	D6009-129	CROSSTUBE
3	2	D3595-063-570	RUBBER CUSHION
4	1	D2896-1	SUPPORT
5	2	D3189-1	CHAFING SHIELD
6	2	D2856-600-1009	ABRASION STRIP
7	4	MS21920-28	CLAMP
8	2	MS21920-30	CLAMP (OR MS21920-32)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTROMBELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

D

1) MATERIAL: MANUFACTURED FROM D6009-129

FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING/TRIMMING)

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2

TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 47.0 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1. SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOPCORY 219G A SCO. The Scope SUBJECT OF A SUDMENT Winds Caller WORK MER WORK 12/02/10

@ DEO ATTACHED

MFG. AP		172	D412-664-243	<u>-</u>	HEET 1 OF 4		
CHECKE		_P	DRAWING NO.		REV. E		
DRAWN		RF	HAWKESBURY, ONTAR				
DESIGN		PH	DART AEROSP	ACE	LTD		
REV.			DESCRIPTION	BY	DATE		
Α	NEW IS	SSUE		PH	01.10.17		
В	ADD H SKIDT		OMPATABILITY WITH BHT/AA PH 05.02.04				
С		REMOVE D2856-600-1087, ADD D2732-058 & MB MAGNOBOND 6398, MS21920-32 WAS MS21920-30					
D	REMO	VE D2732-05	8, CHANGE TO D3595-063-570	PH	07.03.09		
E	REORG TO CUP PAR 08- C8-3 &	ANIZED VIEV RRENT STAN -046 (ZN A6-3	GENERAL NOTES; NS AND REFORMATTED DRAWING DARDS; RELOCATED FLAG #6 PER 1); ADD TOLERANCE (ZN 86-3, C4-3, D TURNING DETAIL & UPDATED EET 4.	, RF	09.09.30		

DATE 09.09.30

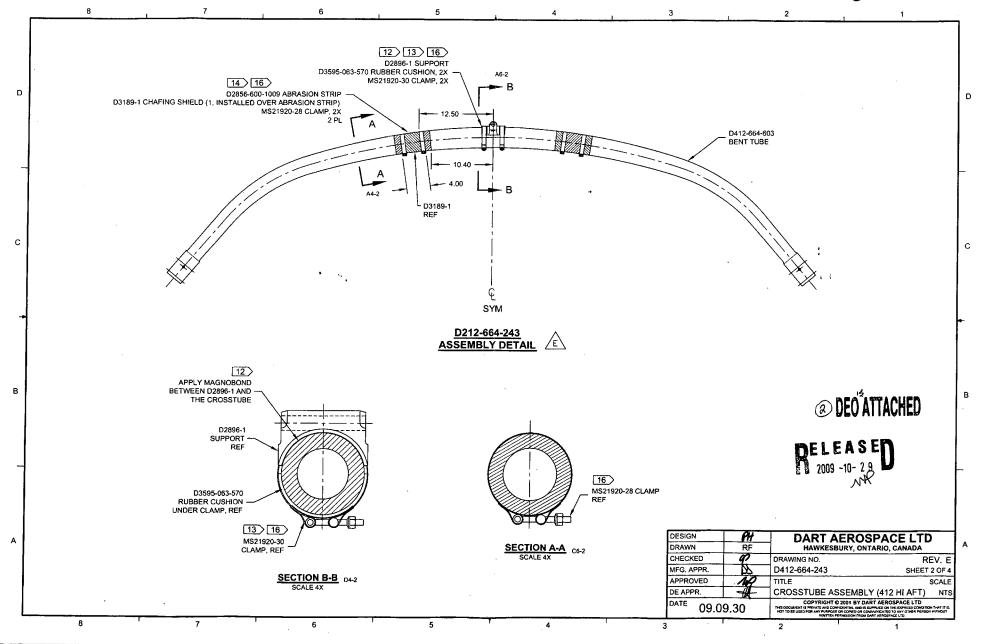
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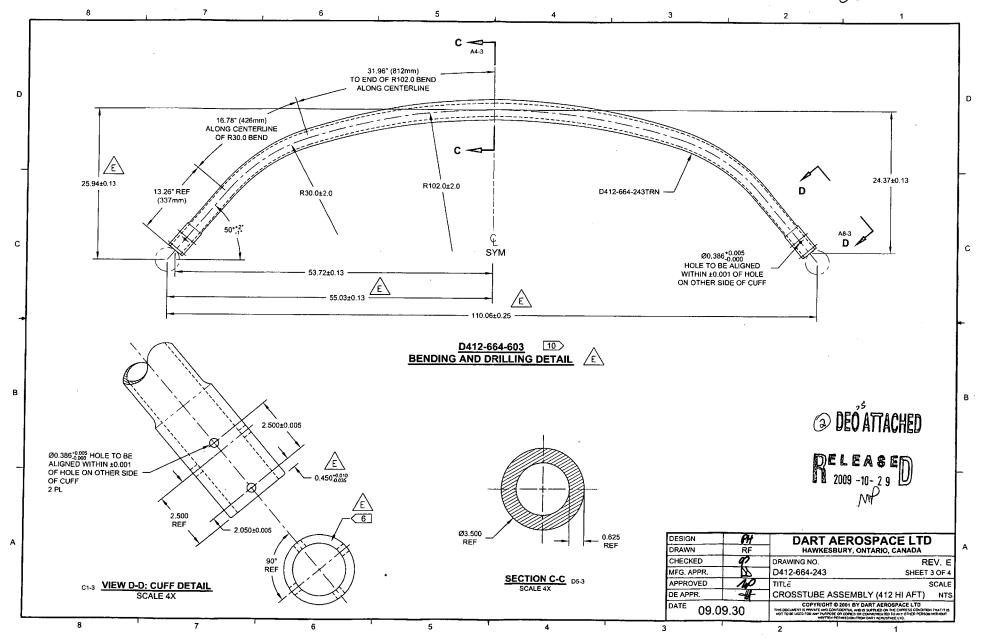
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CROSSTUBE ASSEMBLY (412 HI AFT) NTS

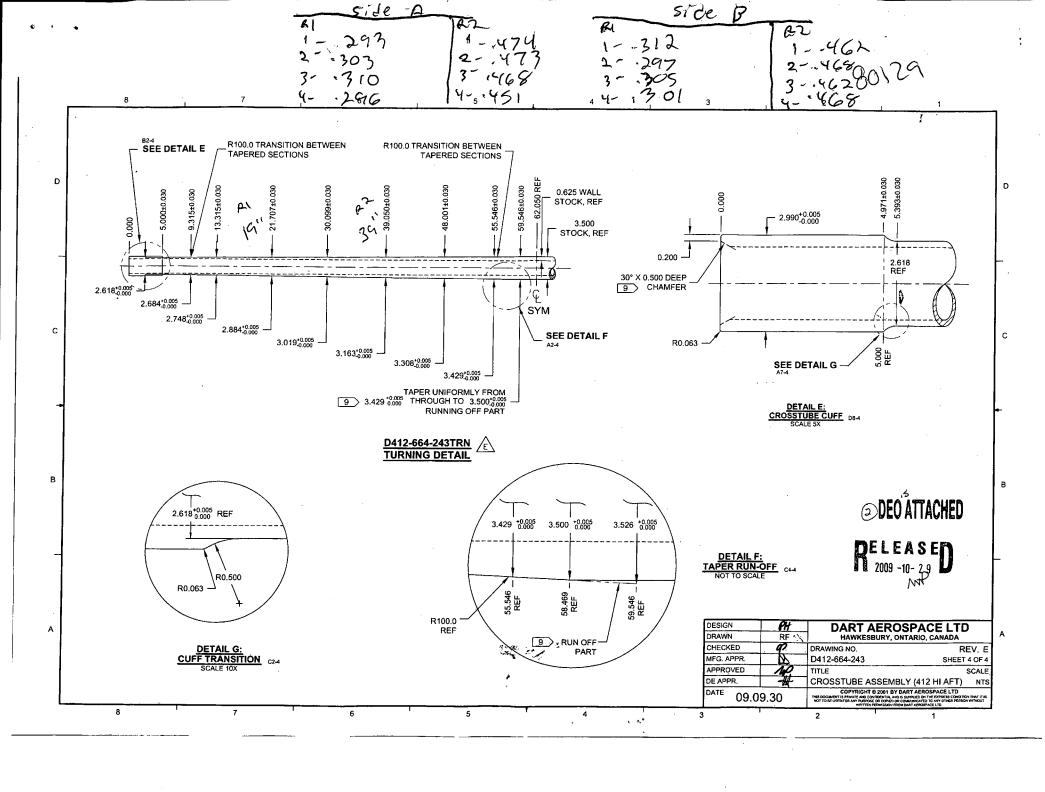
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egge Elizabeth		PAR #: Fault Category: NCR: Yes No DQA: Resolution: Disposition: QA: N/C Closed: WORK ORDER NON-CONFORMANCE (NCR) Description of NC Corrective Action Section B	Chief Eng	QC Inspector						
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DRAWING NO.	TITLE	REV. E	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO. S	SCALE
D412-664-243	CROSSTUBE ASSEME	BLY (412 HI AFT)	ENGINEERING ORDER	D412-664-243-E-1	SHEET 1 OF 2	NTS
DRAWN	以 CHECKED	M	MFG. APPR.	APPROVED WA	DE APPR.	
DATE 11.03	3.31 DATE	11/03.31	DATE //.03.31	DATE 11/03:3)	DATE 11-03.31	

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

<u> IS:</u>

Item	Qty -243	Part Number	Description	
6	0	D2856-600-1009	ABRASION STRIP	

WAS:

6	2	D2856-600-1009	ABRASION STRIP

NOTES 2 AND 14, SHEET 1 ARE AMENDED AS FOLLOWS:

<u>IS:</u>

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, APPLY CLEAR COAT ON HATCHED AREA

14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

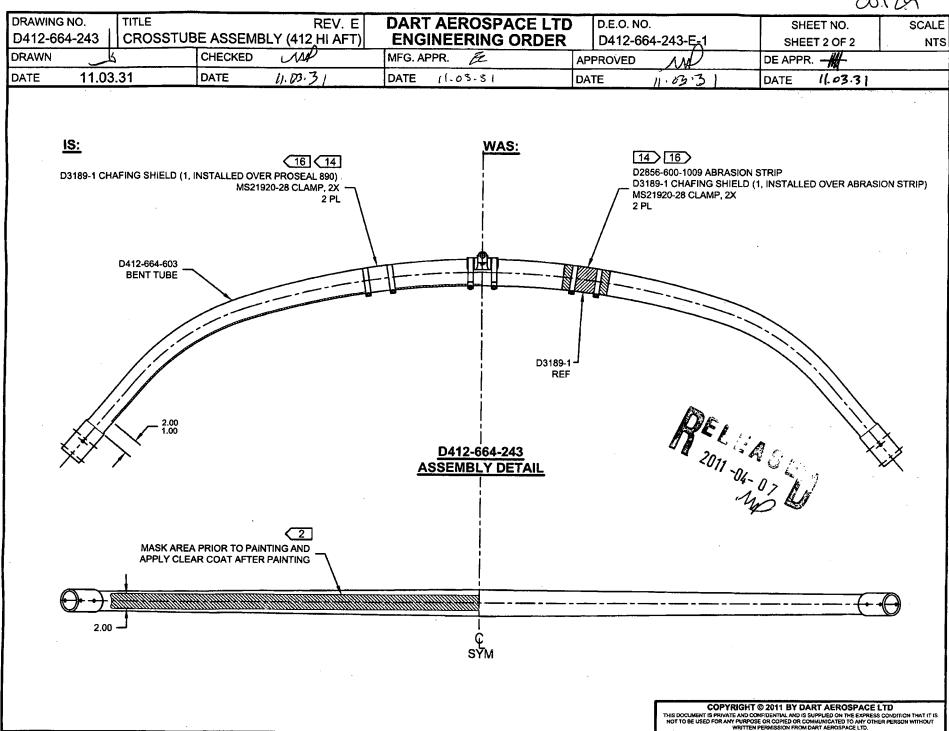
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.



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W/O:			WC	ORK ORDER CHANG	GES		· · · · · · · · · · · · · · · · · · ·			
DATE	STEP	PRO	OCEDURE CHA	NGE		Ву	Date	DQA: Code does not be determined by the property of the	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No	.	PAR #:	Fault Cate		NCF	R: Yes	No DQ	A:	Date: _	
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DATE	STEP	Description of NC	1		tion B		Verific	ation	Approval	Approval
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DATE	STEP	Description of NC			tion B		erification	Approval	Approval
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DRAWING NO. D412-664-243	TITLE CROSSTUBE ASS	REV. E Y (412 HI AFT)	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D412-664-243-E-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 9	CHECK	ED AS	MFG. APPR.	APPROVED M	DE APPR.	
DATE 11.09	.07 DATE	11.09.19	DATE ((.09.19	DATE 11.09.19	DATE 11.09.19	

PURPOSE:

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

ltem	Qty -243	Part Number	Description
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 16, SHEET 1 IS AMENDED AS FOLLOWS:

- 12) INSTALL D2896-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

WAS:

- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



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W/O:		WORK ORDER CHANG	ES					
DATE	STEP	PROCEDURE CHANGE		Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC inspector
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Part No:		PAR #: Fault Category:	NCR: Yes No DQA:	Date:
n	Resolution:	Disposition:	QA: N/C Closed:	Date:

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		Description of NC		Corrective Action Section B		Verification	Approval	Approval QC Inspector
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	
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